cephalopods, all of them of enormous size. Amongst this débris may be noticed the crown and tentacles of a cephalopod, the body of which could not be found, belonging probably to the genus *Cucioteuthis*, hitherto known only by a few fragments. The muscular arms, which, though much shrunk and contracted by the preserving liquid, are as thick as those of a man, were covered with great suckers, each armed with a sharp claw, as powerful as those of the larger carnivora. More than one hundred of these suckers remain adhering to the arms.

The bodies of the two great cephalopods constitute one of the most interesting novelties of the scientific cruise of H.S.H. the Prince of Monaco. Their structure and their appearance are so different from all that is known amongst these animals, that it is impossible to place them in any species, genus, or family of this order. I propose for them the name of *Lepidoteuthis Grimaldii*, hoping that the discovery of complete specimens may permit of their affinities being more perfectly defined. One of these animals, half digested, is useless for study; the other, though headless, is much better preserved. It is a female, of which the body or visceral sac, after prolonged immersion in formol and alcohol, still measures 90 centimetres in length, from which it may be concluded that the length of the complete animal would exceed two metres. The surface of the sac is covered with large, solid, rhomboidal scales, arranged spirally like those of a pine cone. The fin (*nageoire*) is very powerful, and forms one half of the length of the body. It is not furnished with scales.

The stomach of the cachalot contained, besides, another cephalopod of large size, provided with a large fin, the skin of which enclosed certain photogenic organs. The head is wanting, so that it is impossible to affirm with certainty that it belongs to a new species, which is made very probable by the form of the body. Finally, the stomach of the cachalot contained a large number of beaks and rays or plumes, the difficultly digestible residue of former repasts.

The cachalot which was killed by the whalers of Terceira, almost under the keel of the *Princesse Alice*, seems as if it had been guided, in the pursuit of its food, by a desire to devour nothing but animals which, up to the present, are completely unknown, and in addition are of the highest importance for the morphology of the cephalopods. These cephalopods are all powerful swimmers, and very muscular. They appear to belong to the fauna of the deep intermediate waters, which is almost completely unknown, at least as regards the larger animals. They never come to the surface, nor do they lie on the bottom of the sea. Their great agility enables them to avoid every attempt to take them by nets; and it would appear that, for the present, the only means of capturing these interesting and gigantic animals is to commission a bigger giant to undertake the task, and to kill him in his turn when he has performed the service.

Accordingly, it is his Highness's intention for next season, either to add to the already very complete fittings of the *Princesse Alice* those of a sperm whaler, or to attach to her a special whaling tender. It need hardly be added, that the further working up of the unique material already collected is being pushed forward with the greatest energy, and the results will be awaited with interest and impatience. J. Y. BUCHANAN.

NOTES.

MEN of science need no reminder that, however they may be separated by political or racial differences, they are united in the promotion of natural knowledge. Scientific academies and societies in every part of the world delight to admit foreign investigators into fellowship, and to show publicly, by various marks of appreciation, their regard for contributions to known facts of nature, and for assistance in interpreting those already garnered. But though these international amenities are common enough in the world of science, it is but rarely that the Government of one nation does honour to the distinguished men in another. We therefore notice with keen satisfaction that the French Government has just decorated a number of foreign investigators, in connection with the recent centenary of the Institute. Prof. Max Müller has been appointed Commander of the Legion of Honour, and Lord Rayleigh and Prof. Ramsay have been created Officers. The broad feeling that prompted these awards was the same as that which led the French Government to strike special medals to commemorate the late Dr. Hind's discovery of asteroids, and Janssen and Lockyer's method of observing solar prominences in full sunshine; and, more recently, it inspired the Paris Municipal Council to make arrangements for erecting a statue of Newton in Paris. In sharp contrast to the delicate compliments which the French Government and people pay to British science is the insularity which regulates the distribution of those honours that the British Government have at their disposal. So few and so belated, indeed, are the honours conferred upon men of science in our own country, that it is almost vain to think that her Majesty's advisers will one day have the magnanimity to do honour to investigators of other nations. We cherish the hope that the New Year decorations just given to British men of science by France will induce our own Government to return the courtesy.

M. BERTRAND AND M. BERTHELOT, Secrétaires Perpétuels of the Paris Academy of Sciences, have been made Grand Officers of the Legion of Honour. M. Maspero, the distinguished Egyptologist, has been appointed Commander, while Dr. Duclaux, Director of the Pasteur Institute, and MM. Grimaux and Moissan, the eminent chemists, have been created Officers of the same Order. Thus does France honour those who have established their claim "rightly to be great."

PROF. MARK W. HARRINGTON, late Chief of the United States Weather Bureau, and now President of the University of Washington, proposes to establish in the University a department of Terrestrial Physics and Geography, and he would be glad if authors and publishers would send to the University publications relating to these subjects.

A SOCIETY was legally registered in Paris a few days ago, having for its object the propagation of Pasteur's methods in medical treatment. The Administrative Council consists of MM. Duclaux, J. B. Pasteur, Roux, and Radot. The present capital of the Society is £400, in one hundred shares of £4 each, all of which have been taken up.

WHILE all interested in geology will rejoice at the recognition of the services to science and the State rendered by Sir Joseph Prestwich, they will regret to learn he is still in an extremely weak state of health and confined to his bed. Although he has regained a little strength, his convalescence must of necessity be slow.

PROF. SOLLAS, F.R.S., will leave in March for Sydney, to take charge of an expedition that is being despatched to make deep borings in a coral atoll. The scheme, which is supported by a strong scientific committee, has been financed by the Royal Society to the extent of £800; and the Government are placing a gunboat at the disposal of the party, to convey them from Sydney to Funifuti, in the Central Pacific, which has been selected as the scene of operations.

Dr. Donaldson Smith read an interesting paper at the Geographical Society's meeting, last Monday, on his recent journey from Somaliland to Lake Rudolf. He told the story of the adventures of his expedition during the performance of this feat. The results of the journey are of great scientific importance. Dr. Smith has prepared a useful map, based on careful astronomical observations, of the region to the north and north-east of Lakes Rudolf and Stephanie, which has not hitherto been explored. He has also carried a chain of observations across the Borana country, between the Juba and Lake Rudolf. The collections proved of exceptional interest; in Somaliland, Dr. Smith has discovered an avifauna which is most closely allied to that of the Cape. This is in harmony with some other available evidence, and suggests a former immigration into East Africa from land now submerged beneath the Indian Ocean. He has found in the Borana country a fossil which proves the occurrence of Lower Oolitic rocks there; and thus shows the line of connection between the Jurassic beds of Mombasa with those of Shoa and Somaliland. He has also had exceptional opportunities of study of a dwarf tribe, first reported by Harris in 1844, members of which have only been seen twice previously. Dr. Smith's study of the hydrography of the region around Lake Stephanie has thrown light on the famous controversy as to the course of the Omo, though his observations do not settle it.

The fact that calcium carbide is now obtainable commercially has been ingeniously applied by M. G. Trouvé for the purposes of domestic lighting. The principle of his lamp is that of the "Kipp" used in chemical laboratories, in various forms, for the production of hydrogen sulphide and other gases. The mode of arranging the contact of the water and carbide had to be carefully worked out, as an ordinary "Kipp," charged with calcium carbide and water, gives such a vigorous evolution of acetylene as to be unmanageable. An estimate of the working cost of the lamp compared with that of coal gas is favourable to the former in Paris, where gas is costly (7*s.* per 1000 feet); but in London, if the carbide could be obtained at the same price (4½*d.* per lb.), the cost would still be double that of ordinary lighting gas.

Some interesting investigations on the vitality of typhoid bacilli inoculated into oysters have been carried out by Mr. Charles Foote. It appears that during the first fortnight following the introduction of the typhoid bacilli, undoubted multiplication of these microbes took place, but after that time had elapsed a steady decline in numbers was observed. The presence of typhoid bacilli within the oyster was, however, still demonstrable even thirty days after they were first introduced, and they were, moreover, observed in the stomach of the oyster, where they remained unimpaired in a vital condition. In some other experiments the water in which the oysters were immersed was also inoculated with typhoid bacilli, and it was actually found that they lived longer within the body of the oyster than in the water in which the latter was preserved. These investigations materially assist in justifying the hypothesis as to the possible contraction of typhoid through the consumption of oysters.

The *Publishers' Circular* states that the number of new books issued in England in the course of last year was 5581, and of new editions 935, making a total of 6516 publications. By dividing these works into thirteen classes, an idea is given of the kinds of literature which make up this total. In the educational, classical, and philological class, 660 new-books were published, and 111 new editions. These numbers are a little in advance of those of previous years. The number of new books classified under "Arts, Sciences, and Illustrated Works" is 96, in addition to 16 new editions. But no definite idea with reference to the issue of scientific books can be obtained from these figures, owing to the unsound system of classification adopted. Why illustrated works should be classified with scientific works passes our comprehension. Moreover, there is something wrong about the figures, for in science alone we noticed in these columns last year many more than sixteen new editions of British books. Under the heading "Voyages, Travels, Geographical Research," 263 new books are given and 75 new editions. This was a slight decrease on the publications of 1894. In medicine, surgery, &c., 153 new books were issued and 53 new editions, this being a remarkable increase on the issues of the previous year.

We note that the table of mean values for pressure, temperature, rainfall, and bright sunshine, which is published in the *Daily Weather Report* issued by the Meteorological Office, has been materially improved this year. In the first place, five more years of observations have been added to those from which the monthly means for each of the elements are calculated. Secondly, new columns have been added, showing the absolute maximum and minimum temperatures recorded during the month and the years in which such extremes occurred. The mean values are now mainly for the twenty-five years 1871–95, and the extreme readings afford valuable information as to whether the maximum and minimum temperatures recorded during each month are exceptionally high or low for the season. A glance at the table for January shows, for instance, that during the last twenty-five years the highest temperature recorded at any station included in it, in that month was 59° at Nairn and Cambridge, and the lowest, – 4° at Wick. Sunshine values at a few more stations would further enhance the value of this otherwise very complete *Report*.

The "Triton" Society for the study of Aquaria and Terraria in Berlin has recently announced its intention of awarding prizes to the amount of 1500 M. for the best original solutions of certain problems connected with the management of fresh-water aquaria. The competition is open to all, and the problems in question are as follows:—(1) A method for the destruction of the more injurious ectoparasites of fishes, *e.g.* Gyrodactylus, Ichthyophthirius, Chilodon, Myxosporidia; (2) a method of exterminating the fresh-water polyp, Hydra, from aquaria; and (3) a method for exterminating the tube-worm, *Tubifex rivulorum*, from aquaria. In all three cases the methods recommended must be simple, easy to carry out, and effective in their results; but, while fatal to the particular organisms mentioned, they must have no injurious effect upon the fish and plant life of the aquarium. The essays must contain exact accounts of the methods recommended, and full descriptions of the experimental evidence upon which they are based, so that the methods may be readily and accurately repeated. Competitors must write in one of the recognised European languages, and must forward their essays by July 1, 1897, to Prof. F. E. Schulze, Direktor des zool. Instituts, Berlin N., Invalidenstrasse 43. The adjudicators will be Profs. F. E. Schulze and K. Möbius, and Drs. Haack, Hofer, and Schillinger. For the first problem two prizes will be awarded of 700 M. and 400 M. respectively; for each of the remaining problems a prize of 200 M. will be awarded. The Minister of Agriculture will also place two State medals in the hands of the adjudicators for award. Further information in regard to the competition will be found in *Der Zoologische Garten*, Frankfurt, vol. xxxvi. No. 9, 1895, pp. 285, 286.

The annual general meeting of the Institution of Mechanical Engineers will be held on Thursday evening, January 30, and Friday evening, January 31. The annual report of the Council will be presented to the meeting on Thursday. The retiring President, Prof. Alexander B. W. Kennedy, F.R.S., will induct into the chair the President-elect, Mr. E. Windsor Richards

The following papers will then be read and discussed, as far as time permits: "Telemeters and Range-finders for Naval and other Purposes," by Profs. Barr and Stroud; "Calculation of Horse-power for Marine Propulsion," by Lieut.-Colonel Thomas English; "Notes on Steam Superheating," by Mr. William H. Patchell.

THE Home Secretary has just issued the following order:—(1) The Wild Birds Protection Act, 1880, shall apply within the administrative county of the Parts of Kesteven, Lincolnshire, to the following wild birds, viz.:—Kestrel, merlin, hobby, common buzzard, honey buzzard, swallow, house martin, sand martin, swift, and wryneck, as if those species were included in the schedule to the Act. (2) The taking or destroying of the eggs of the following wild birds is prohibited within the administrative county of the Parts of Kesteven, Lincolnshire, viz.: Goldfinch, kingfisher, nightjar, nightingale, owls (of all species), ruff or reeve, woodpecker, kestrel, merlin, hobby, common buzzard, honey buzzard, swallow, house martin, sand martin, swift, wryneck, teal, and wild ducks (of all species)."

THE last published number of the U.S. *Weather Review* (June 1895) contains some interesting notes on the early history of weather telegraphy. The Morse telegraph was put into operation between Baltimore and New York on May 27, 1844, and it is said that a few days only had elapsed before the operators began to forewarn each other of the more important weather changes. In the *American Journal of Science and Arts*, vol. ii. 1846, Mr. W. C. Redfield notified that the approach of a gale, when the storm was yet on the Gulf of Mexico, or in the Western States, might be made known by means of the electric telegraph. A similar opinion, by Prof. Loomis, was published in the Second Annual Report of the Smithsonian Institution for the year 1847. A remarkable enterprise was undertaken by a news agency in New York; on January 24, 1848, Messrs. Jones and Co. advertised that they had made arrangements to give daily and hourly reports of meteorological phenomena from all parts of the country which were in telegraphic communication with New York; this advertisement appeared in *Silliman's American Journal of Science* for March 1848. The subsequent steady development of telegraphic weather reports culminated in the publication of daily maps; further particulars respecting the early development of meteorological telegraphy will be found in "Weather Charts and Storm Warnings," by Mr. R. H. Scott.

AN apparatus which illustrates all the laws of falling bodies, and also shows the tension or force acting upon them, is described by K. Hrabowski in *Wiedemann's Annalen*. It consists of a carriage moving on a single rail, somewhat on the Lartigue railway system, pulled by a weight drawn over a pulley, the string being connected to the carriage by a spring moving up and down in a vertical tube. To the upper end of the spring a pencil is attached, which moves along a vertical plate, and leaves a mark as the carriage runs along. When the carriage is at rest, the pencil stops at the point indicating the amount of the moving weight. Immediately on starting, the spring contracts, and the pencil-point traces a curved line which gives the force acting upon the carriage at every point. The line becomes horizontal when the carriage and weight have equal velocities, the tension in the spring being then just sufficient to overcome friction, and the amount of the latter may also be seen at a glance. By inclining the rail, the phenomena of acceleration downwards, or retardation upwards, may be easily studied. The apparatus is cheap, and should form a useful adjunct to science classes.

THE following account of the method used by the Bushmen of Namaqualand to poison their arrows is given in the *Scientific African*:—"Many methods of preparing the poison have been described, and according to some the poison is said to be extracted from the root of the plant, *Buphane toxicaria*, or Gift-bol, but it seems that the extract is only used as a resin. Some resin, either from the Gift-bol or from one of the members of the Euphorbia group of cactus-like plants, is first obtained, and the sticky substance is placed on a stone. The Bushman then goes with a forked stick to look for the 'ring-halse' or black night-adder, not the puff-adder which is called the ring-halse. Having found the snake, by a dexterous thrust of the stick the animal is imprisoned just behind the head by the two prongs of the stick. The prepared stone is then placed in the mouth, and the upper jaw forced right back. By this somewhat rough treatment the poison glands become compressed, and two drops of poison forced out on the fangs and caught on the stone. The poison is then well mixed with the resinous matter, and is ready for use. In the earlier days a more complicated procedure was adopted, through the medium of the witch-doctor. The whole head of the puff-adder was obtained and put in a pot along with the resin, and beetles and noxious herbs added to the incantation of the witch-doctor. The whole was stewed up amid great excitement. When the contents of the vessel were properly mixed, the sticky compound was collected by stirring it with a stick, to which the matter adhered, and on becoming cold, remained on the stick as a black knob, and formed then an article of barter."

A DESCRIPTION of the gold fields of the Southern Appalachians, based on a recent survey by Mr. G. F. Becker, forms part of the latest volume of the "Mineral Resources of the United States." There are a few small placer deposits in this field, which afford but little gold. They are of interest, however, in that they furnish undoubted proofs, in Mr. Becker's opinion, that alluvial gold is not formed by accretion, but by the wearing down of particles already present as such in quartz lodes. He accounts for the high standard of alluvial gold, and especially for that of the outer layers of nuggets, by assuming that the silver and other impurities have been removed in solution by running water; and he clinches his argument by quoting the opinion of Orviedo, one of the lieutenants of Columbus. Mr. Becker further narrates how he has traced the complete transition from hard auriferous quartz to true placer gravels through a series of "saprolites," a name proposed by him to designate "thoroughly decomposed, earthy, but untransported rock." He distinguishes them as "granitic saprolite" and the like, and claims that the use of such a term would be very convenient. The other gold deposits of the Appalachians are mainly true lodes, occupying fissures which run across the planes of stratification and have been formed by purely mechanical action. In this the author differs from Mr. J. A. Phillips, who thought they were "segregation veins." In whatever manner the veins may have been formed, however, there can be no doubt about some deposits of a slightly different kind occurring in Carolina, and bearing much resemblance to the *fahlbands* of Norway. These Carolina *fahlbands* are extensive lens-shaped masses of rock, which are conformable to the general schistose structure of the country, and are charged with disseminated pyrites and gold. Quartz stringers and veins appear close to and even in the rock masses, but, curiously enough, are barren. It is evident that the *fahlbands* have been enriched by impregnation with solutions containing gold, and also that no true segregation has occurred in these cases.

THE production and application of anti-toxic serum in the treatment of rabies has naturally been regarded as a subject the study of which could only be a question of time. The preliminary experiments on this subject made by Messrs. Babès and Lepp in 1889, had not been followed by any great advance in this direction until this year, when a most elaborate and weighty memoir on the preparation of anti-rabic serum has been contributed to the *Atti della Reale Accademia delle Scienze dell' Istituto di Bologna*, by Messrs. Tizzoni and Centanni. The authors have succeeded in obtaining a powerful anti-rabic serum from sheep by inoculating them seventeen times in the course of twenty days with attenuated nerve-substance obtained from rabid animals, which is introduced in the proportion of 0·75 grm. per kgr. weight of the animal to be treated. Already a few minutes after the serum has been subcutaneously injected, the blood has acquired immunising properties, a result which with Pasteur's anti-rabic method is only obtained after several days, and then not invariably. As a *preventive* measure the authors state that 1½ drops of serum is sufficient to protect an animal weighing 2 kgr. inoculated twenty-four hours later with dog virus. As a *curative* measure the subcutaneous inoculation of 1 cubic centimetre even eight days after the animal has been infected with rabies, and therefore in the middle of the incubation period, is sufficient to stay all further progress of the disease. With this anti-rabic serum, Messrs. Tizzoni and Centanni have been easily able to render rabbits—these animals being especially susceptible to rabies—immune, a result only accomplished under exceptional circumstances by Pasteur's method. Rabbits again, even after the disease has made considerable progress, can be saved by a single subcutaneous injection of anti-rabic serum, whilst the Pasteur method under such conditions has never succeeded in curing them. The authors claim for their method that it is more efficacious, and at the same time less cumbrous than that at present in use. The serum is readily transferable, as it can be desiccated, and kept in bottles, protected from light, for a long time without undergoing any detriment. It thus can be forwarded to all parts of the world, and can be employed by local physicians, therefore preventing delay in treatment, and the necessity of the patient travelling to be treated in special institutes. The further application of anti-rabic serum will be watched with the greatest interest, and the verdict which time and experience alone can furnish will be anxiously awaited.

The forthcoming number of the *Physical Review* will contain articles on the photometry of differently-coloured lights and the "Flicker" photometer, by Prof. Frank P. Whitman; the chemical potential of the metals, by Mr. Wilder D. Bancroft; and on the freezing-points of dilute aqueous solutions, by Mr. E. H. Loomis.

Messrs. G. Philip and Son have just published a special coloured map of British Guiana, to illustrate the Venezula-Guiana boundary dispute. The map shows clearly British and Venezuelan territories and claims, the original and modified Schomburgk lines, gold-mining districts, and many other features of the region surrounding the disputed area.

At the celebration of the second centenary of the death of Christian Huygens, held at Amsterdam in July 1895, Dr. J. Bosscha delivered before the University a valuable address on the life and work of that rare genius. It will interest many of our readers to know that this address, with numerous details appended to it, has been published by Wilhelm Engelmann, Leipzig.

An illustrated paper "On the Entomology of the Illinois River and Adjacent Waters," by Mr. C. A. Hart, is published in the *Bulletin* of the Illinois State Laboratory of Natural History (vol. iv. pp. 149–273, 1895). The paper gives a part of the results of observation and study of the insect fauna of the Illinois River and adjoining waters in the neighbourhood of the University of Illinois Biological Experiment Station, at Havana, Illinois, during the first year of the station work.

The "Brief Sketch" of the meteorology of the Bombay Presidency for the year 1894–95 shows that the rainfall of the year 1894 was exceptionally good. During the month of July it was excessively heavy, owing to three severe cyclones, whereby disastrous floods were caused in various districts. The abnormally heavy rainfall on the Ghauts converted the mountain streams into rushing torrents, which swept everything before them, and rendered railway traffic impossible. At Surat a sudden rush raised the level of the river four feet within a quarter of an hour; communication was cut off with all surrounding villages, causing great loss of life from starvation or drowning. It is satisfactory to note that little or no damage was done in the town of Bombay by the immense quantity of rain which fell, owing to the great improvements that have been made in the drainage during the past few years.

Last year's volume of the *Journal of Conchology* (vol. viii.), which was founded in 1874 by Mr. J. W. Taylor, of Leeds, and ably conducted by him for a period of twenty-one years, contains the record of some important changes which have taken place in the management of the journal during the past twelve months. Four quarterly numbers of the journal were issued during the year. The first informed us that the journal had become, by purchase, the property of the Conchological Society, and would be continued as the official organ of that Society, under the editorship of Mr. W. E. Hoyle. All four numbers contain original papers of varied character and interest, accompanied in some cases by good lithographic or photographic plates of illustrations; and the Proceedings of the Conchological Society, as published in the journal, alone furnish an interesting record of valuable observations in many departments of malacology. The annual report of the Conchological Society for 1894–5 is contained in the July number. From it we learn that all arrangements have been made for the transfer of the headquarters of the Society from Leeds to Manchester, with branches in Leeds and London—a change which, it may be hoped, will contribute still further to the growth and vigour of the Society.

Several novel scientific instruments and devices described in the new catalogues of scientific apparatus and of lanterns and slides, recently issued by Messrs. Newton and Co., deserve mention here. A very simple method devised to show stereoscopic pictures with the optical lantern is especially noteworthy. A pair of negatives is taken with a stereoscopic camera, and a lantern slide is made from each. One of these slides is mounted in contact with a bluish-green glass, and the other in contact with a red glass. The two slides are simultaneously projected upon a screen, by means of two lanterns, but are not exactly superimposed. The combined picture is then viewed through spectacles, the glasses of which are of the same kind as those covering the slides. Only the red picture is seen through the red glass, and only the bluish-green picture with the bluish-green glass. And as the two pictures are from stereoscopic negatives, a definite stereoscopic effect is produced by making each eye only see one of the pair of pictures, the combination of both of which gives the effect of relief. An advantage which this method possesses is that it can be used with any pair of lanterns. All that is required is stereoscopic slides mounted with suitably coloured glasses, and similarly coloured spectacles through which the pictures must be viewed. Under these conditions, the pictures stand out in strong stereoscopic relief upon the screen. Among the many new forms of instruments described, we notice a new sunshine recorder, and several improved forms of electric lamps for lanterns. The catalogue of lantern slides should be seen by all who use the lantern in science lectures. It includes Prof. Boys' photographs of "flying bullets," sixty-three slides illustrating volcanic action, from photographs by Prof. Johnston Lavis; photo-micrographs of rock-sections, and many other subjects. The slides are so numerous, and cover so wide a range, that teachers of any and every branch of science will find some in which they will be specially interested.

We have on our table a number of new editions of books already reviewed in Nature. One of these is the second edition of the "Lehrbuch der Botanik" (Jena: Gustav Fischer), by Drs. Strasburger, Noll, Schenck, and Schimper. This important work was first published in 1894, and the quick call for a second edition shows that botanists have not been long in finding out its admirable qualities. Dr. Oscar Hertwig's classic "Lehrbuch der Entwicklungsgeschichte" (Gustav Fischer) has now reached its fifth German edition. A number of new figures has been added, and results obtained by embryologists in the two years that have elapsed since the publication of the fourth edition have been incorporated in the text. Another fifth edition recently received is "Dynamo-Electric Machinery" (E. and F. N. Spon), by Prof. S. P. Thompson, F.R.S. The chief changes that have been made relate to alternate-current machinery. These and other additions have been made necessary by the development of electric machinery since 1892, when the fourth edition of Prof. Thompson's elaborate work appeared. A second edition has been published of "Dynamo Attendants and their Dynamos" (*Electricity* Office), by Mr. A. H. Gibbings. The book is intended for those practical men who have charge of electric lighting plant without knowing much about electrical principles; it consists, therefore, mainly of hints and advice as to how to manage dynamos, and what to do under those perplexing circumstances which occur in the best regulated dynamo rooms. After six years, a second edition has been published of "Service Chemistry" (W. B. Whittingham and Co.), by Prof. Vivian B. Lewes. The volume is primarily intended to be an exposition of the applications of chemistry in the naval and military services; nevertheless, a fair proportion of its space is taken up with descriptions of the general principles upon which all technical chemistry depends. Messrs. W. Collins, Sons, and Co. have issued a new edition of "A Manual of Inorganic Chemistry," by Prof. T. E. Thorpe, F.R.S. Since this manual was first published, twenty-three years ago, it has been frequently reprinted, but the new edition contains so much new matter, and is so greatly altered, that it is practically a new text-book, which will be found even more serviceable than the original one. The work is published in two volumes, which deal, respectively, with the non-metals and metals; it has been brought thoroughly up to date, and well records the present state of knowledge of the chemistry of the mineral kingdom.

The additions to the Zoological Society's Gardens during the past week include two Bonnet Monkeys (*Macacus sinicus*, ♂ ♂) from India, presented by Mr. F. Greswolde Williams; a Common Marmoset (*Hapale jacchus*) from South-east Brazil, presented by Captain Pickthorn; four Pratincoles (*Glareola pratincola*), four Marbled Ducks (*Anas marmorata*), South European, presented by Lord Lilford; a Snow Bunting (*Plectrophanes nivalis*), European, presented by Mr. J. E. Harting; two Passerine-Parrakeets (*Psittacula passerina*) from Brazil, presented by Mrs. Robert McCabe; a Ring-necked Parrakeet (*Palæornis torquata*) from India, presented by Mr. E. Parrott; a Leadbeaters Cockatoo (*Cacatua leadbeateri*) from Australia, presented by Mr. B. T. Frere; two Leopard Tortoises (*Testudo pardalis*), two Puff Adders (*Vipera arietans*), an Infernal Snake (*Sepedon hæmachates*) from South Africa, presented by Mr. J. E. Matcham; a Manatee (*Manatus australis*) from Demerara, presented by Captain Edward J. Collings; a Southern River Hog (*Potamochœrus africanus*) from South Africa, presented by Mr. W. Anthony Morgan; a Black-handed Spider Monkey (*Ateles geoffroyi*) from Central America, a —— Terrapin (*Hydromedusa tectifera*) from Rio de la Plata, purchased.

OUR ASTRONOMICAL COLUMN.

Celestial Photography by Simple Means.—In the hands of Prof. Barnard, the "magic lantern" lens has developed into an instrument of considerable astronomical importance. The lens actually employed by him is a 1½ inch doublet of 4 or 5 inches equivalent focus, and the scale of the pictures is roughly 10° to an inch. Six beautiful photographs of various parts of the Milky Way taken with this small optical aid are reproduced in the *Astrophysical Journal*, vol. ii. No. 5, and they admirably illustrate the value of such an instrument in the delineation of extended nebulosities and in photographing large areas of the sky. They are selected from the more remarkable parts of the Milky Way, but Prof. Barnard has obtained a great number of such photographs, and proposes soon to construct a photographic chart from them. The picture of the new nebulous region in Scorpio shows two very obvious streams or "dark lanes" which are almost void of stars, and various peculiarities are presented by the other photographs.

In the same journal there is a reproduction and an account of a very fine photograph of the nebula near ξ Persei (N.G.C. 1499) taken with an exposure of six hours by means of the 6-inch Willard telescope, at the Lick Observatory, on September 21, 1895. The nebula is very irregular with numerous condensations, and is remarkable for a small dark spot, about 6′ in diameter, in its northern part; "doubtless a hole in the nebula," says Prof. Barnard. Attention is drawn to the suggestive fact that this nebula lies on the edge of a region in which there is a comparative absence of small stars, as noticed also in the case of most of the large diffused nebulæ lately photographed.

The Constant of Nutation.—A new determination of the constant of nutation has been made by Dr. Chandler (*Astronomical Journal*, No. 361). It is based on a discussion of 20,294 observations of stars with the mural circles of Troughton and Jones at Greenwich during the years 1825–1848. In order to eliminate errors due to possible slow changes of the angle between the pole and the zenith, whether strictly or irregularly systematic, it has been considered necessary to employ a large number of stars, distributed as uniformly as possible over the entire sky; and the Greenwich observations offer this facility, while at the same time possessing the necessary degree of accuracy. The adopted mean value of the latitude of Greenwich is 51° 28′ 38″·42, and assuming that this is the same in all years, the nutation is found to be 9″·197, after eliminating the short-period terms of the latitude variation. This assumption, however, is not justified, as the observations indicate a pronounced deviation, which cannot be explained by anomalies of refraction, but must be due to a change in the place of the zenith. Although such a change may possibly be subjective, Dr. Chandler thinks it much more likely to be due to an actual slow change of the latitude. The observations favour an inequality of the mean latitude with a period of about twelve years, and a range of about a quarter of a second. To whatever cause this change may ultimately be ascribed, it is at least necessary to take account of it in evaluating the constant of nutation; and when this and all other corrections have been applied, the definitive value of the nutation, from the observations with the Greenwich mural circles, is 9″·192 ± 0″·012. Combining this result with all previous ones which are entitled to any weight at all, the final value becomes 9″·202. The corresponding reciprocal of the moon's mass, in terms of that of the earth, is 81·80, if 50″·36 be taken for the luni-solar precession.